no response whatever. Older larvæ, Plutei and Bipennariæ, became oriented in stronger currents and went to the kathode. Again at a later stage of development the electrotaxis completely disappears. All theoretical discussion of the results is left for a future paper.

In view of the character of the papers here reviewed, particularly the first, further work along the same lines by Dr. Carlgren will be awaited with interest.

RAYMOND PEARL.

ZOÖLOGY.

An Introduction to Zoölogy.[1] — In twenty chapters the authors take up successively the grasshopper, the butterfly, the beetle, the fly, the lithobius, the spider, the crayfish, daphnia, the earthworm, nereis, the slug, the fresh-water clam, the starfish, the hydra, paramœcium, the smelt, the newt, the lizard, the English sparrow, the mouse. In each the type and "its allies" are described from a general natural-history standpoint and with an appended key to the chief representatives of the group. A last chapter deals briefly with the development of the frog's egg.

Then in one appendix we find the stimulating outlines of laboratory work upon each of the above twenty-one forms that was proposed for entrance requirement at the Lawrence Scientific School, Harvard University. A second enumerates more than one hundred works and papers of reference; and a third gives a useful classification of the animal kingdom, with brief distinguishing characters of larger groups and references to the pages of this work, in which orders and families are mentioned. An index and glossary conclude the four hundred and twelve pages.

The book is well described in the preface: "The general plan of this text-book is at the same time both old and new. Old, because it attempts to restore the old-time instruction in Natural History; new, because Natural History is not to-day what it was a generation ago. The treatment will seem new also in contrast with modern text-books of zoölogy, since they are devoted primarily to comparative anatomy, a field upon which we lay little stress. . . . It is a guide to the study of animals, which it is hoped may introduce many

[1] Davenport, C. B. and G. C. *Introduction to Zoölogy.* A Guide to the Study of Animals, for the use of Secondary Schools. New York, Macmillan, 1900. xii + 412 pp., 306 figs.

students to the sciences of comparative anatomy, comparative embryology, cytology, general physiology, variation and inheritance, and the others that are grouped under 'zoölogy.' This book is like a 'Synoptic Room' in the vestibule of a vast museum, containing the most essential things for those who can go in but a little way, but also fundamental for those who can penetrate farther."

This Natural History, vivified by general physiology, seems worthy to replace many of the school text-books now in use, if only the teacher be prepared to make the field and laboratory work dominate over the "cram" which presentation of so many facts makes an opening for.

The three hundred and eleven illustrations are a most important feature, remarkable in that the majority are from original photographs. Many of these are excellent, and, as the authors state, "their publication may be considered as something of a contribution to science." Yet it is to be regretted that, in some illustrations of invertebrates, black photographs have been preferred to good drawings; while, on the other hand, in the higher groups, notably the mammals, drawings of stuffed specimens have been used, where photographs from life, such as those of Gambier Bolton, might have been used to advantage.

We hope the book will meet with a success that will insure revisions. Meanwhile, the "blue crab" figured on page 109 will be of peculiar interest to the specialist.

E. A. A.

Merogeny. — The notable work of Yves Delage, first published in the *Comptes Rendus*, October, 1898, and in detail in the *Archives de Zoologie Experimentale*, VII, Nos. 3 and 4, 1899, widens the field of experimental research by a new method, and adds facts difficult to assimilate with the current conceptions of the phenomena of fertilization.

In the echinoderms *Strongylocentrotus lividus* and *Echinus sp.*, in the mollusk Dentalium, and in the annelid *Lanice conchylega*, he has succeeded in cutting eggs into two or more pieces and in keeping these pieces under observation in drops of water till they developed into the characteristic larvæ of these groups. In each case sperm was added, and it is inferred that it entered and fertilized the pieces. Moreover, in some echinoderm eggs the egg nucleus was seen in one piece and not in the other; yet the piece with no nucleus formed a larva just as well as did the piece with a nucleus. It is inferred that most of the fragments were without nuclei.